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GEOGRAPHIC SUPPORT PROJECT

SINKIANG

SELECTED GEOGRAPHIC CHARACTERISTICS OF THE LOP NOR AREA

CIA/RR GS 65-7

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CENTRAL INTELLIGENCE AGENCY

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FOREWORD

This report was prepared in response to a specific requirement. It is not considered to be a complete geographical appraisal of the Lop Nor area.

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CONTENTS

Tables

SINKIANG

SELECTED GEOGRAPHIC CHARACTERISTICS OF THE LOP NOR AREA*

I. General

The arid and relatively low Lop Nor "basin" is actually the eastern end of the vast almond-shaped Tarim Basin of Sinkiang (see Map 51382). Its situation within this mountain-enclosed interior basin, far removed from incursions of moist air, accounts for the prevailing desert conditions. The drying effects of the prevailing northeasterly winds are instrumental in creating, both to the east and to the west of Lop Nor (Lake), some of the most desolate and sterile wastelands in Central Asia. The waters of the Konche Darya, an extension of the Tarim River system which feeds Lop Nor, provide the only moisture sufficient to sustain a ribbon of sparse vegetation along its banks; rain is extremely scanty; and ground water, where it approaches the surface, only serves to increase the salinization of the soil. Occasional wild camels, gazelles, wild boars, and waterfowl inhabit the basin. The only human beings in the area live in scattered settlements along the banks of the upper Konche Darya. The nuclear test site is northwest of the lake.

The Lop Nor basin measures approximately 150 miles from east to west and 80 miles from north to south. Its floor is a drab flatland about 2,550 feet above sea level. A range of low mountains, the Kuruk Tagh, rises several thousand feet above the basin on the north; a higher barrier, the Astin Tagh, rims it on the south. Low hills and desert form the eastern margin of the basin, and to the west it is open to the vast stretches of the Takla Makan desert.

Within the Lop Nor area are several significant terrain elements -- the lake itself, the Konche Darya, large sand dunes, several microterrain types of soil formation (shor, yardang, and sai), and the mountains that rim the basin on the north and on the south.

* Available sources of specific data on the Lop Nor area are meager. Those used for this study include explorers' records; published scientific papers, both Soviet and Chinese; various intelligence publications, maps, and photographs. The base of the accompanying map contains inaccuracies in the positioning of geographic features, in elevations, and in the indication of the size and shape of Lop Nor as it is now. Where differences occur between the text and the map, the text reflects the most recent information.

II. Terrain

A. Lop Nor

See Figure 1

As the Konche Darya spills into the large shallow Lop Nor Basin, it forms Lop Nor -- a lake that varies in area and depth from season to season and from year to year, depending on the volume of water flowing into it and the rate of evaporation. The position of Lop Nor within the basin has been reported to migrate from north to south and vice versa, as a result of the vagaries of the shifting channels of the Tarim River system. Explorers' records of the late 19th and early 20th centuries indicate that the Tarim River formerly followed a southeasterly course through the desert west of the present site of Lop Nor, eventually entering the basin and forming a lake in the southern part of the depression. In 1920-21 the main stream of the Tarim, probably because of silting, shifted into a former channel, a dry riverbed -- then called the Kum Darya, now the Konche Darya -- that followed the foothills of the Kuruk Tagh in an easterly direction, causing Lop Nor to shift from the southern to the northern portion of the basin.

During the past decade Lop Nor has consisted of two parts -- a shallow northern half that was sometimes, even at high water, only ankle deep and a deeper bowl-shaped southern half, where depths of 9 or 10 feet were recorded. The northern part of the lake was predominantly fresh; the southern section was brackish to salty. In 1930-31, at the time of Sven Hedin's last explorations in the area, Lop Nor measured 78 miles from north to south and 48 miles from east to west at the widest point. There is evidence to suggest, however, that the lake is currently shrinking in size, because of the upstream diversion for agricultural purposes of some of the waters of the Konche Darya. Lop Nor now may actually consist of two small lakes, an oblong lake in the north that is oriented northeast-southwest and a residual bowl-shaped lake in the south.

High water in Lop Nor normally comes in late September and in October, a reflection of the July-August high-water level in the Konche Darya. The rate of evaporation in the desert is high -- 3 feet a month is not unusual. In the flat-bottomed, shallow lakebed a drop of less than 20 inches in water level can uncover as much as 3 miles of ground. During the winter (December through February) Lop Nor freezes to a depth of 1 to 3 feet.

The bed of Lop Nor is composed of stratified lacustrine sediments, with alternating layers of clay, mud, and salt crust. The top layer consists of a yellow sediment 0.08-0.27 inch thick that rests on a black sediment 0.39 inch thick, underlain by a layer of coarse sand 0.8 inch thick and a 3.1-inch stratum of crystallized salt. The present rate of accumulation of sediments is difficult to ascertain; the establishment

of large state farms on the upper reaches of the Konche Darya may have drained off a large volume of water for irrigation purposes, thus reducing substantially not only the size of the lake but also the rate of deposition.

B. Konche Darya
See Figure 2

From its source in Bagrash Kol (Lake) the Konche Darya flows out of the mountains and merges with the Tarim River for a short distance and then continues in an easterly course along the base of the Kuruk Tagh toward the Lop Nor basin. The streambed of the Konche Darya is braided and tortuous, with perpendicular banks of clay and sand rising 2 to 9 feet above the surface of the water. The river is constantly undercutting the soft banks and changing its course. A distinguishing characteristic of the river, noted by several explorers, is the frequent sharp cracking sound caused by the collapsing riverbanks. The heavy load of silt carried by the river is deposited either along the banks in the lee of the current or on the bed of Lop Nor. The Konche Darya is frozen from December through early March.

Desert-tolerant vegetation consisting of trees, bushes, and reeds grows along the riverbanks. The soils that have developed under this narrow band of vegetation contain some humus and a noticeable accumulation of biogenic soda. South of the river, the water table is usually found at a depth of 15 to 30 feet; to the north, toward the base of the Kuruk Tagh, it lies at progressively deeper levels.

C. Sand Dunes
See Figure 3

Not far east of Lop Nor are old, easily eroded lacustrine deposits of greyish-yellow fine sand, powdered sand, and mixtures of sand and clay. In these fine-grained deposits the strong winds erode hollows that generally are 15 to 25 feet deep, 30 to 100 feet long, and 30 to 65 feet wide. The sands blown out of these hollows are deposited in dunes that rise as much as 25 feet above ground level. In the western part of this dune area the dunes tend to be larger and more closely spaced. They are completely bare and shift constantly. Beyond the dunes to the east is the Gashun Gobi, a gravelly wasteland of pebbles, sand, and small rocks.

Another dune area occupies the triangle formed by Lop Nor on the east, the Konche Darya on the north, and the old bed of the Tarim River on the west. These dunes are barchans, or crescent shaped, and are as barren as the dunes to the east of Lop Nor, but they differ somewhat in size as well as shape. They are 10 to 16 feet high, with windward slopes as much as 165 feet long. The crests are 100 to 165 feet apart, and the hard ground surface between the dunes is seldom exposed. Near the shore of the lake

the areas between the dunes may be occupied by small residue ponds and saline marshes.

These desert sands contain a large amount of epidote and hornblende and small quantities of zircon, titanium, iron ore, and tourmaline. The salts are of the sulfate-chloride type with some evidence of soda-sulfates along the Konche Darya.

D. Shor
See Figure 4

Shor is a local name given to the saliferous mud residue left by the retreating waters of Lop Nor. When wet it is treacherously slippery; when dry it becomes hard as a brick and buckles into ridges, giving the appearance of a frozen plowed field. The crests of the ridges are 12 to 20 inches above the troughs. In large areas of these old lacustrine strata, particularly to the east of Lop Nor, the hard salt crust covers alternating beds of fine-grained sand and loess-textured clay, the latter being a mixture of alluvial materials and powdery windblown sand. The surface of an old salt crust is always devoid of vegetation; the color is usually grey. Older crusts gradually disintegrate, partly because of the erosive action of windblown sand. Younger crusts tend to be porous and brittle, although they are generally strong enough to sustain the weight of a man.

E. Yardang
See Figures 1 and 5

Yardang is a distinctive type of terrain composed of long undulating clay ridges with perpendicular banks that are separated by deep corridors; both ridges and corridors are oriented from 20°-25° north-northeast to 200°-205° south-southwest, conforming to the direction of the prevailing winds. Yardang is created by the powerful action of the strong northeasterly winds that pick up tiny particles of abrasive sand and scour out the less resistant strata, sometimes creating fantastic shapes. The highest ridges are 80 to 100 feet above the corridor floors, which vary from 30 to 100 feet in width. The floors of the corridors are virtually covered with small sand-and-gravel crescentic dunes 8 to 16 inches high and about 4 feet long that trend in the same general northeast-southwest direction as the ridges. The largest areas of yardang are located north and northeast of Lop Nor, and the smaller areas are west of the lake.

F. Sai
See Figures 1 and 6

Beginning about half a mile beyond the northern bank of the Konche Darya and extending 8 to 15 miles toward the steeper slopes of the Kuruk

Tagh is a zone of desert gravel called sai, an alluvial surface composed of detritus washed down the mountainsides. This is the type of surface on which the test site is located. The average gradient of this particular zone is about 8 percent. The thickness of the layer of alluvial materials varies from less than 5 feet to more than 50 feet on outwash fans. It is a stratified complex of boulders, silty gravel, and silty sand on the upper slopes of the alluvial fans, grading to silt and silty clay on the lower slopes. A few outcroppings of flat-topped mesa structures, possibly limestone, rise above the alluvial sediments. These mesas appear to be remnants of old terraced benches. They are cut through in places by slightly incised dry gullies and outwash fans.

Little of a precise nature is known of the rock structure beneath the sai. It is a relatively stable part of the earth's crust with a foundation of ancient metamorphic strata and granites overlain with a thin layer of late Tertiary and Quaternary sedimentary deposits. This narrow zone is well suited to surface construction and underground excavations. In late winter the ground is frozen to a depth of 1 to 3 feet.

The water table is shallow (20 feet or less underground) near Lop Nor and becomes progressively deeper (50 to 80 feet) toward the slopes of the Kuruk Tagh. The water is highly mineralized.

G. Mountains

The Kuruk Tagh, rimming the Lop Nor basin on the north, is a spur of the higher Tien Shan to the west. The Kuruk Tagh consists of a series of parallel ridges of ancient origin separated by small interior drainage basins, salt encrusted and dry except after rare flash floods that occur mainly in spring and early summer. Individual summits of the Kuruk Tagh rise to more than 8,000 feet in the west, but in the area north of Lop Nor 4,500 feet is average. The local relief in these ridges closely reflects the underlying structure and composition of the rocks. Narrow rocky ridges correspond with limestone outcroppings, whereas broad hollows and rolling hills are underlain by a thick stratum of sandy shale. Lead and zinc deposits in outcroppings of limestone have been noted in the vicinity of Altmisch Bulak, a salt spring to the north of Lop Nor.

Isolated to the east and south of the main part of the Kuruk Tagh is an outlying ridge, the Charchak Tagh. It is a barren rocky crest that is curved like a bow, slightly over 10 miles long, a mile wide, and with a maximum elevation of 4,100 feet. The trend in the western part of this ridge is east-west; the central highest part bears 130° southeast; and as the ridge continues, it curves toward 155° southeast. The Charchak Tagh stands out sharply against the surrounding terrain because of its elevation and its light coloration.

The Astin Tagh, to the south of the Lop Nor basin, is part of the Kun-lun Shan system. This range is 10,000 to 12,000 feet high and effectively shields the Lop Nor basin from winds from the south.

III. Climate

A. General

The Lop Nor area experiences desert conditions of extreme aridity, with sand and dust blown by strong winds. Temperatures are very high during the summer and relatively low during the winter, and at all seasons they are characterized by wide daily fluctuations. The outstanding climatic features of the Lop Nor basin are the frequent sandstorms and duststorms that occur primarily, although not exclusively, in the spring and early summer.

B. Winds

See Tables 1 through 4

In contrast to the rest of Sinkiang, prevailing surface winds in the Lop Nor area are from the north-northeast in winter and the northeast in summer. They are more variable in summer when the governing pressure systems are less clearly defined. In the piedmont regions north and south of the basin, wind direction is affected locally by the terrain -- air currents tend to funnel through passes and flow down valleys or mountain slopes.

Severe windstorms, occurring as often as four times a month in spring, are frequently associated with the passage of cold fronts to the north of the Lop Nor basin. They may also occur as sudden squalls that nearly always approach the basin from the northeast. The rare occasions in June and July when the wind shifts to the southwest are normally followed by brief and violent windstorms or rain. Most storms occur in the late afternoon (see Table 1)* and are usually followed by a sharp drop in temperature.

* With the exception of 1964 data on winds aloft over the Lop Nor area (Table 4), climatic statistics for the Lop Nor basin are not available, but they should approximate those of weather stations at Charkhlik to the southwest, Tikenlik to the west, and Tun-huang to the east. Data from these stations are presented in Tables 1 through 3 and 5 through 11. Except for temperature and precipitation figures from Tun-Huang, which are for the period 1938-50, these tables are based on records made between 1955 and 1961. Years of record for Charkhlik and Tikenlik are few, however, and data from these stations should be used with caution. It should also be noted that because of the terrain the climatic conditions in this general area may vary considerably within short distances.

Maximum speeds of surface winds (0 to 10,000 feet) by months are highest in April and May (see Table 2). Although the tabular information indicates high winds in January at Charkhlik, they usually decline in the late fall and winter. At all times of the year surface wind speeds increase from a low in the early morning hours to a high in the late afternoon (see Table 3). Visibility is greatly reduced during and for some time after periods of high winds by the haze of windborne sand and dust. As much as 25 percent of the time the visibility at certain hours in spring and early summer is reduced to less than 2.5 miles.

For winds aloft (10,000 to 100,000 feet), wind speeds increase with altitude to about 40,000 feet and then decrease. Wind speeds at altitudes below 20,000 feet are strongest in winter and spring and weakest in summer and autumn. Prevailing winds above 10,000 feet are westerly.

C. Temperature
See Tables 5 through 8

June, July, and August are the hottest months in the Lop Nor basin. During that period, most daytime temperatures are above 90°F; nighttime temperatures range downward to the 60°'s. During the November through February period, mean daily maximums do not exceed 51°F and mean daily minimums remain below 25°F. In winter a temperature inversion may persist for several days, and under optimum conditions it may last a week or more. This has a general effect of trapping fine sand, dust, or other airborne particles in the lower layer of air and reducing visibility in much the same manner that temperature inversions over industrialized metropolitan areas produce smog.

D. Precipitation
See Table 9

Precipitation in the Lop Nor area averages less than an inch a year; in some years no rain or snow is recorded. Occasionally, a wind shift to the southwest during the summer will produce a convectional shower of large raindrops or, occasionally, hail. Frequently, the raindrops evaporate in midair, and only the dirt they carry reaches the ground.

E. Cloud Cover
See Tables 10 and 11

The Lop Nor area has moderate amounts of cloud cover. Spring is the cloudiest season, with mean cloud cover up to 88 percent in March and April; and autumn is the least cloudy, with mean cloud cover as low as 12 percent in October. Diurnal variation of mean cloudiness is not great; cover is generally at a maximum in the afternoon and a minimum during the night. Statistics for Tikenlik tend to indicate that the northern part of the Lop Nor basin, where the test site is located, has less cloud cover

than the southern part, as reflected in the statistics for Charkhlik. Data on the frequency of types of clouds that occur over the Lop Nor area are not available. The warm summers would probably be conducive to the formation of cumuliform clouds, however, whereas the cold winters would limit vertical development and be conducive to the formation of stratiform clouds.

IV. Vegetation
See Figures 6, 7, and 8

Conditions for the growth of vegetation in the Lop Nor area are completely unfavorable. Few species of plants are able to withstand the wide fluctuations of temperature, the strong winds, and the lack of water. The development of a vegetative cover is also limited by the salinity of the soils, the broad expanses of shifting sands on the lowlands, and the bare rocky slopes of the mountains. What vegetation exists is largely confined to the banks of the Konche Darya, the marshes along the margins of Lop Nor, and a few salt springs.

On the alluvial sai the very sparse vegetation (ephemerals, calligonum, and a few halophytes) exists only in crevices and hollows. A few depressions and salt springs contain standing pools of saline and bitter transparent water where thickets of chiya (Lasiagrostis splendens) 18 inches to 3 feet high, fragrant ephedra (Ephedra przewalskii, E. distachya) up to 3 feet high, various varieties of tamarisk (Tamarix elongata, T. laxa, T. hispida) 6 to 9 feet tall, and a few shrubs like camelthorn (Alhagi sparsifolia) and lopuma (Apocynum hendersonii), a form of Indian hemp, constitute the usual plants. Closer to the Konche Darya and usually along dry riverbeds a few desert-tolerant grasses and perennial shrubs, all characterized by an extremely scanty number of species, appear. They include Anabasis truncata, Gymnocarpos przewalskii, Kalidium schrenkianum, Reumuria soogorica, Salsola curiosa (a saltwort), Sympegma regelii, and Zygophllum xanthoxylon (a beancaper). Because these plants have large and deep root systems in relation to their foliage, they are adapted to the extreme aridity of the area. Alhagi sparsifolia, for example, averages 2 feet in height with a spread of 15 inches above the ground, while beneath the surface the root system reaches downward about 18 feet with extensive lateral growth, which also contributes to the stabilization of the sandy soils.

Along the Konche Darya, thin stands of poplar (Populus diversifolia and P. pruinosa), locally called tograk, mingle with copses of reeds, shrubs, grasses, and herbs. The tograk is the distinctive tree of the area, generally reaching 30 to 36 feet in height. It has an extensive lateral root growth, thick sturdy trunk, and resilient leaves and branches. Rarely are the branches broken or the trunks uprooted by the strong winds of the region. Lower vegetation generally comprises only a few species of plants, the most common being a feathergrass (Phragmites communis), a

licorice root (Glycyrrhiza inflata), and lopuma (Apocynum hendersonii). The dividing line between existence and extinction is a water table depth of 18 feet. Where the water table sinks below that level, as it does along rivers whose channels are constantly shifting, plants wither and die.

V. Animals

The scarcity of water and its high mineral content, the sparsity of vegetation, and the large areas of barren sands and salt desert have severely limited the number of species of animals that are able to survive in the Lop Nor area. Waterfowl, insects, insect-eating birds -- especially those that feed in the air -- fish, and a few larger animals such as the boar, gazelle, and the almost extinct two-humped wild camel inhabit the area. Because of the coldness of the ground and the wide distribution of unstable soils, there are few burrowing animals, amphibians, and reptiles, although both frogs and lizards have been seen along the Konche Darya.

The marsh grasses and reeds of Lop Nor and the Konche Darya shelter a wide variety but not a large number of waterfowl and migrant birds. The yellow-legged herring gull, the black-headed gull, the great white egret, the black stork, the bittern, the sheld duck, the gadwall, the great-crested grebe, and the greylag goose are commonly seen. The eastern heron and the osprey nest in the poplars, as do the mandarin duck and the coot. The woodpecker, horned owl, isabelline shrike, pheasant, rock dove, carrion crow, swift, swallow, tree sparrow, crested lark, and white wagtail have all been sighted in the area. Along with these are some birds of prey (kite, eastern golden eagle, sea eagle, hobby, and kestrel) and scavengers (long-legged buzzard and vulture).

About a dozen kinds of fish of the carp family have been identified in the lower Konche Darya and Lop Nor, including loach, tazen-balik, olur-balik, and several species of marinka. In Lop Nor some fish as large as 2-1/2 to 3 feet long manage to survive in water only 8 inches deep.

The high-velocity winds are a determining factor in the kinds of insects found in the Lop Nor area. Flying insects live only in the trees and the beds of reeds, which are not penetrated by the strong winds. Several species of creeping insects that are able to conceal themselves in surface irregularities in the ground are found in the desert areas. They include tarantula, phalangida, a scorpion up to 2 inches in length, and a poisonous spider called karakurt (Lathrodectus tredecemguttatus Rossi).

Of the larger animals, a few gazelles (Gazella subgutturosa) inhabit the foothills, wild boars live in the reeds along the river, and the wild camel roams the desert.

Table 1

Charkhlik, Tikenlik, and Tun-huang

Number of Days With Duststorms and/or Sandstorms
(At Specified Hours, Local Standard Time)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Years of Record
Charkhlik													3-5
0000	4.0	3.0	6.0	7.0	7.0	4.0	3.0	2.0	2.0	1.0	1.0	1.0	
0600	4.0	3.0	6.0	7.0	7.0	4.0	3.0	2.0	2.0	1.0	1.0	1.0	
1200	3.0	2.0	6.0	7.0	4.0	8.0	4.0	1.0	2.0	1.0	1.0	1.0	
1800	5.0	4.0	11.0	9.0	8.0	5.0	5.0	1.0	3.0	3.0	2.0	1.0	
Tikenlik													1
0000	1.0	0.0	0.0	1.0	na	na	0.0	0.0	0.0	0.0	0.0	0.0	
0600	0.0	0.0	0.0	1.0	na	na	0.0	0.0	0.0	0.0	0.0	0.0	
1200	3.0	1.0	2.0	4.0	na	na	0.0	0.0	2.0	1.0	0.0	0.0	
1800	1.0	1.0	2.0	4.0	7.0	4.0	2.0	2.0	0.0	0.0	1.0	0.0	
Tun-huang													3
Hours not specified	1.0	5.0	1.3	2.3	4.3	2.3	1.0	1.3	0.0	0.3	0.0	0.7	

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Table 2

Charkhlik and Tikenlik

Maximum Speeds of Surface Winds

In Knots

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Years of Record
Charkhlik	35	27	27	35	35	31	27	31	31	31	27	19	3-5
Tikenlik	16	14	23	23	23	16	19	19	16	17	14	10	1-2

Table 3

Charkhlik and Tikenlik

Mean Number of Days With Surface Winds Greater Than 16 Knots
And No Precipitation
(At Specified Hours, Local Standard Time)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Years of Record
Charkhlik													4-5
0000	a/	0	1	2	4	1	1	a/	1	a/	1	0	
0600	0	a/	a/	1	3	1	1	1	0	a/	a/	0	
1200	1	a/	2	4	4	2	1	2	1	1	1	a/	
1800	a/	a/	1	4	3	1	1	1	1	1	0	0	
Tikenlik													1
0000	0	0	0	0	na	na	0	0	0	0	0	0	
0600	0	0	0	0	na	na	0	0	0	0	0	0	
1200	0	0	2	1	na	na	1	0	0	1	0	0	
1800	0	0	1	1	1	0	1	1	0	0	0	0	

a. Less than half a day.

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Table 5

Charkhlik, Tikenlik, and Tun-huang

Mean Daily Maximum and Minimum Temperatures

In Degrees Fahrenheit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Years of Record
Charkhlik													3-5
Max	30	45	60	74	81	91	96	93	87	70	48	35	
Min	8	18	31	46	52	62	68	63	53	37	23	14	
Tikenlik													1
Max	30	47	62	75	na	na	92	91	82	67	51	39	
Min	7	15	30	47	na	na	66	64	50	36	21	14	
Tun-huang													12
Max	33	42	57	71	82	88	93	91	82	68	48	33	
Min	9	15	29	41	53	61	66	63	50	37	24	11	

Table 6

Charkhlik, Tikenlik, and Tun-huang

Absolute Maximum and Minimum Temperatures

In Degrees Fahrenheit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Years of Record
Charkhlik													3-5
Max	50	64	79	95	99	102	108	106	99	86	66	46	
Min	-8	5	7	28	30	48	54	52	36	18	10	-2	
Tikenlik													1
Max	39	63	75	90	na	na	100	102	88	82	59	45	
Min	-4	3	19	32	na	na	57	52	39	25	14	3	
Tun-huang													12
Max	50	70	78	93	101	103	111	109	98	89	72	49	
Min	-9	-10	10	14	26	40	48	47	34	18	2	-13	

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Table 7

Charkhlik and Tikenlik

Mean Number of Days With Maximum Temperatures Higher Than 90°F

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Years of Record
Charkhlik	0	0	0	2	5	20	28	25	12	0	0	0	3-5
Tikenlik	0	0	0	2	na	na	22	18	0	0	0	0	1

Table 8

Charkhlik and Tikenlik

Mean Number of Days With Minimum Temperatures Lower Than 32°F

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Years of Record
Charkhlik	31	28	17	2	0	0	0	0	0	9	28	31	3-5
Tikenlik	31	28	23	11	na	na	0	0	0	10	30	31	1

Table 9

Charkhlik and Tun-huang

Mean Precipitation

In Inches

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years of Record
Charkhlik	a/	0.0	a/	0.0	0.0	a/	a/	0.1	0.0	0.0	0.0	0.0	0.2	na
Tun-huang	a/	a/	0.1	0.1	0.2	0.4	0.6	0.2	0.1	a/	a/	0.1	1.9	12

a. Less than half an inch.

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Figure 1. Aerial view of northeastern extremity of Lop Nor. The lake is in left background, with typical sai topography extending from the edge of the lake toward right background. Distinctive parallel ridges of yardang appear in foreground.

Figure 2. View on the upper reaches of the Konche Darya. On the right is a former channel, now dry. Although the vegetation along this stretch of the river is more luxurient than can be expected downstream in the Lop Nor area, it is of the same general type.

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Figure 3. Crescent-shaped sand dunes west of Lop Nor. Only a few scattered tamarisk bushes survive in this desert, usually those near the shore of the lake.

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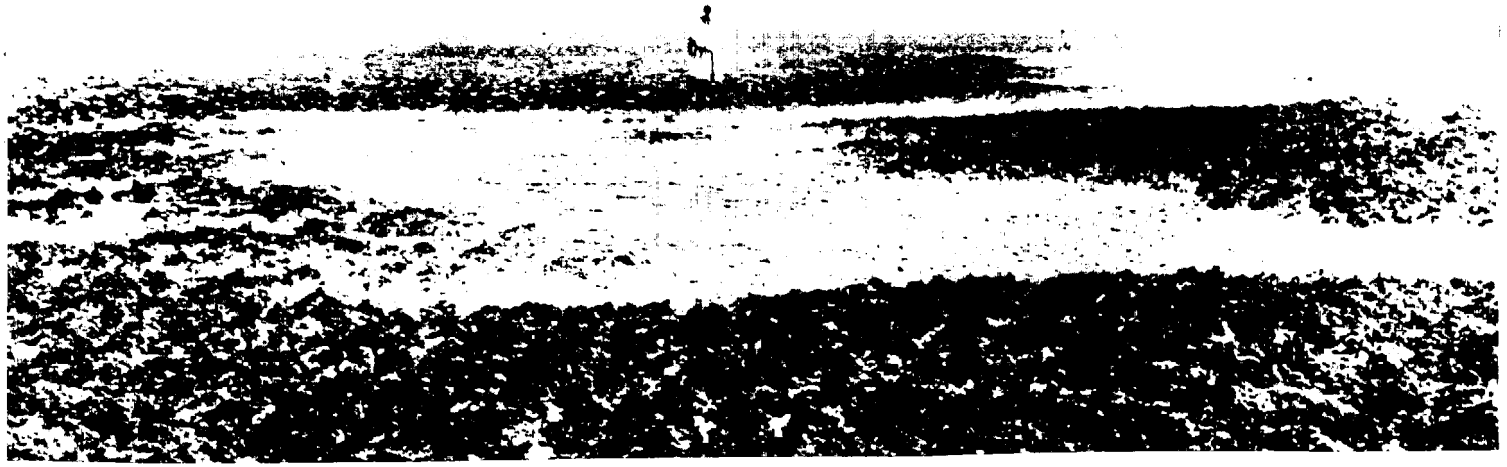

Figure 4. Salt-encrusted shor. Large areas of shor resemble frozen plowed fields.

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Figure 5. Ground view of yardang. The orientation of the ridges conforms to the direction of prevailing winds.

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Figure 6. Ground view of sai. The low terraced benches, possibly limestone, overlook the northern part of the Lop Nor basin.

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Figure 7. Dry watercourse typical of old channels near Konche Darya. Tamarisk and other desert-tolerant shrubs grow in the old riverbed, and dead tograk trees line the banks.

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Figure 8. Vegetation around salt spring at Altrisch Pulak.

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